DOCUMENT RESUME

ED 062 212 SE 013 741

TITLE	Recommendations for Improving Mathematics Education.
INSTITUTION	Montana Council of Teachers of Mathematics.
PUB DATE	72
NOTE	18p.
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	Curriculum Development; Instruction; *Leadership Responsibility; *Mathematics Education; Student Teacher Relationship; *Teacher Associations; *Teacher Education; Teacher Participation; Teacher Responsibility

ABSTRACT

This booklet lists 50 recommendations made by the Professional Standards Committee of the Montana Council of Teachers of Mathematics (MCTM). The items cover: (1) conditions of instruction, professional climate, leadership, curriculum development, and in-service retraining; (2) the responsibilities of higher education in pre-service and in-service education, and in research, development and leadership; (3) the rights and responsibilities of teachers and students; and (4) the role of the MCTM. (MM)

ED 062212

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RECOMMENDATIONS FOR IMPROVING MATHEMATICS EDUCATION

A STATEMENT OF PROFESSIONAL CONCERNS AND RESPONSIBILITIES

by

The Montana Council of Teachers of Mathematics

1

SE 013 741

CONTENTS

Sections and Items	Item Numbers
PREFACE	i
THE EDUCATIONAL ENVIRONMENT	
Conditions of Instruction	1- 7
Professional Climate	8-13
PROVIDING FOR CHANGE AND DEVELOPMENT	
Leadership	14-16
Curriculum Development	17-18
In-Service Retraining	19-21
RESPONSIBILITIES OF HIGHER EDUCATION	
Pre-Service Education	22-26
In-Service Education	27
Research, Development and Leadership	28
RIGHTS AND RESPONSIBILITIES	
The Teacher	29-35
The Student	36-42
THE ROLE OF MCTM	43-50

ACKNOWLEDGEMENTS

Many of the ideas contained herein are found in similar documents which this committee had the opportunity to review. We especially wish to acknowledge the contribution of the Minnesota Council of Teachers of Mathematics from whose publication "Patterns for Professional Progress" we used many statements verbatim.

We also wish to acknowledge the assistance of many Montana mathematics educators whose comments and suggestions have strengthened this document.

PREFACE

We do not presume that the suggestions in this document represent all of the professional concerns and recommendations which need to be considered as we attempt to improve the quality of mathematics education in Montana. Neither do we expect each mathematics educator to agree with all of the particular recommendations. It is our hope, however, that these recommendations will suggest to all members of the educational community some areas of concern to which they might address themselves.

We urge schools at all levels, guided by but not limited to the recommendations in this document, to set priorities according to their particular needs and resources and to pursue implementation of these priorities with a cooperative spirit. By so doing, we hope to be better able to envision what mathematics education might be in our schools as well as to better understand what it presently is.

The implementation of any or several of these suggestions will not, in itself, necessarily represent an improvement in the schools. As Robert B. Davis, Director of the Madison (Mathematics) Project puts it, "Who in education has not often felt that hope, style, ego-ideals (even inspiration) constitute the only hard core currency that is involved in a teaching-learning transaction." These are not the kinds of things you "write down." But we do believe that these recommendations can give us direction as we attempt to provide increased **opportunity** for professional growth, increased **opportunity** to improve student-teacher relationships and increased **opportunity** for students to explore mathematics.

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THE EDUCATIONAL ENVIRONMENT

We recognize and accept the responsibility to assist in creating an educational environment in which students are given the maximum freedom and opportunity to learn mathematics suitable to their needs and abilities. To this end, we recommend that all members of the educational community become directly involved in making decisions regarding the conditions under which instruction is carried on. We further recommend that all work together to establish a professional climate which maximizes the potential for professional growth and makes best use of individual talents.

CONDITIONS OF INSTRUCTION

1. Special concern should be given to the teaching of exceptional children (culturally deprived, physically and/or emotionally handicapped, talented, retarded, slow learners, and deviant behavior problems).

Under most circumstances, the number of exceptional students assigned to any class must be kept as small as possible. Such classes should be assigned only to teachers who are academically and psychologically prepared to work with exceptional children. We particularly emphasize that inexperienced teachers who have neither the special qualifications nor the desire to teach exceptional children should not be required to do so.

2. Teachers must not accept teaching assignments in curriculum areas where they are insufficiently prepared.

Generally, teachers should not be required to teach in areas in which they are not endorsed by the State of Montana. Such endorsement, however, does not automatically imply sufficient preparation to teach all subjects under the endorsed area. We emphasize that teaching assignments should be fairly distributed among qualified staff members so that each teacher can gain wide experiences throughout the mathematics curriculum.

3. We must begin to provide for increased educational opportunities for Montana's Indian students and other cultural minorities.

Social, economic, and cultural variables must be investigated to determine what instructional environments are needed to meet the special educational needs of minority children. Funds must be provided to establish programs to meet these special needs. Minority groups should be encouraged and allowed to accept leadership in their schools. Adequate financial, academic, clerical, and moral support must be given to attract and encourage those qualified persons who are willing to work to bring about the needed changes. Teachers and administrators who are insensitive to the special needs of minority children should be encouraged to seek employment elsewhere.

4. Class size should depend upon which students are being served and what instructional techniques are being used.

Basic elementary school classrooms should not exceed twenty students. Conventionally scheduled secondary classes should not exceed twenty-five students. Under ordinary circumstances, no secondary teacher should meet, on average, more than 100 students per day nor should more than three preparations be required. However, schools

employing innovative instructional designs and schedules and/or making use of clerical and para-professional aides should be allowed to adjust class size accordingly.

5. School systems should provide clerical assistance for mathematics teachers.

Clerical assistance should be provided to aid in the correction of objective homework and examination papers, in record and attendance keeping, in preparation of routine materials, and in carrying out other nonprofessional tasks which take so much energy from the basic teaching assignment. Teachers are, in turn, professionally obligated to spend the time thus freed to gain a better understanding of their students' needs and how to serve these needs.

6. Every mathematics teacher should have private office space.

Mathematics teachers need a place to meet and work with students on an individual basis, a place to work without interruption and a place to keep personal and private files. A teacher might use his classroom as an office provided no other teacher uses that room during the day. However, where that condition does not exist, regular office space should be provided.

7. Mathematics teachers and students should be consulted on the design and furnishing of physical facilities.

New curricular innovations such as mathematics laboratories and math resource centers make necessary corresponding innovations in the design and furnishing of new and remodeled facilities.

PROFESSIONAL CLIMATE

8. Both elementary and secondary teachers should have some time free from student contacts so that they might pursue lesson preparation, curriculum development, materials review, staff interaction, personal study, and other activities.

While most secondary teachers now have such a "free hour," this is not the case in the elementary schools. We particularly emphasize that similar provisions should be made for all elementary teachers. In order to provide this release time, elementary schools might plan innovative schedules, employ specialists (music, physical education, art) and utilize para-professional assistants.

Teachers at all levels (elementary, secondary, college) should be given the responsibility and freedom to organize and control their activities during the times they are not scheduled to teach.

9. Each school district should provide each teacher with at least two professional days per school year.

Teachers should be encouraged to plan independent activities for their professional growth. In particular, teachers could visit other schools, both inside and outside of the district, confer with college or university leaders in mathematics education, and participate in the activities of their professional organizations.

10. Mathematics teachers should be allowed and encouraged to pursue professional growth opportunities.

School districts should provide sabbatical leave with at least two-thirds salary for its teachers with seven or more years of service. Those teachers who do not qualify for a sabbatical should be provided released time to engage in further professional growth without jeopardy to their position or salary advances. A wide variety of educational opportunities should be considered including academic study, teacher exchanges, extensive study of and/or participation in curriculum developments at home and abroad, travel, industrial work experience and research.

11. School districts should allow and encourage faculty members to attend professional meetings in order that they might

keep abreast of innovations in mathematics education as well as enjoy opportunities for the exchange of ideas, for leadership development and for professional recognition.

A. *For meetings held in Montana, conference participants should be reimbursed for expenses by their district and a teaching substitute provided.*
B. *At least one elementary and one secondary mathematics teacher from each district should attend a national or regional NCTM meeting each year. Larger districts should set quotas which would allow interested teachers to attend at least one such meeting every five years with full reimbursement. We suggest selection and reimbursement be made according to the following criteria.*
   a. *Eligibility . . . The teacher should be a member in good standing of the organization whose convention he wishes to attend.*
   b. *Substitute . . . The school district should identify and pay a teaching substitute for the teacher's classes during his absence.*
   c. *Expenses . . . All acceptable expenses should be paid by the school district such as transportation, registration (exclusive of membership), food and lodging.*
C. *If a teacher wishes to attend a national or regional convention at his own expense, he should be encouraged to do so. In this case, the school district should at least pay for a teaching substitute during his absence.*

12. Each school should maintain a professional library for its teachers.

A. *To better enable teachers to carry out their daily work and to provide resources for continuous professional growth each school should, with the counsel of its mathematics teachers, establish a professional library. Such a library should contain a wide selection of publications devoted to education, mathematics and mathematics education.*
B. *Schools should maintain institutional memberships in such organizations as MCTM, NCTM, SSMA, MAA and ASCD* and the journals of these organizations should be readily available to teachers.*
C. *The library should make use of the Educational Resources Information Center (ERIC) which provides current mathematics education research, reports, and other documents on inexpensive microfilm and microfiche as well as hard copy. Each library should have at least one microfilm/microfiche reader-printer.*

13. We urge administrators to set a professional climate which will allow all members of the educational community to develop and use their full potential.

A. *Administrators should provide students and teachers with opportunities for involvement in educational decision making and should themselves become involved as coordinators, advisors and consultants.*
B. *Administrators should set the "tone" for innovation and should encourage teachers in their attempts to find new and improved ways to help students learn mathematics.*
C. *Administrators should not require teachers to perform duties or accept teaching assignments for which they are not qualified or endorsed. Administrators should work to eliminate trivial policies and tasks regardless of their administrative convenience or utility.*
D. *Administrators, like teachers, have a first responsibility to students and must, therefore, refuse to conceal the effects of the public unwillingness to provide adequate funding, must refuse to defend poor and inadequate teaching performances and must refuse to establish or maintain policies or practices which are not in the best interests of students.*

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*1) MCTM: Montana Council of Teachers of Mathematics
2) NCTM: National Council of Teachers of Mathematics
3) SSMA: School Science and Mathematics Association
4) MAA: Mathematics Association of America
5) ASCD: Association for Supervision and Curriculum Development

PROVIDING FOR CHANGE AND DEVELOPMENT

What is known about mathematics is increasing at an astounding rate. We are also beginning to learn a great deal more about how people learn mathematics. We believe schools must provide for change and development in the mathematics curriculum by delegating leadership, by establishing committee structures and by maintaining an in-service retraining program for teachers at all levels.

LEADERSHIP

14. Each school district should have a person who is responsible for the vertical and horizontal coordination of the K-12 mathematics program.

A. School districts with K-12 enrollment of more than 5,000 pupils should employ a full-time K-12 mathematics coordinator. Smaller districts should consider at least a half-time coordinator. If this is impossible, districts should cooperate with their neighbors to share the services of such a person.

B. Among the responsibilities of the K-12 mathematics coordinator may be the following. He should:

- *a. stimulate curriculum change*
- *b. involve teachers from all levels in decision making*
- *c. implement curriculum decisions*
- *d. help teachers keep informed of new trends and research*
- *e. be available for demonstration, consultation and in-service retraining of teachers*
- *f. meet and work with other subject area leaders so that a balanced curriculum may be developed*
- *g. promote interdistrict cooperation in meeting common responsibilities*
- *h. maintain contact with the mathematics consultant of the Office of the State Superintendent of Public Instruction.*

15. There should be a trained mathematics resource teacher within each elementary school.

This person should have sufficient funds and sufficient released time from normal classroom obligations to:

- *a. visit and work with classroom teachers*
- *b. be available for demonstration teaching*
- *c. help teachers keep informed of new materials and techniques*
- *d. teach in-service courses that emphasize both content and method*
- *e. help to organize and maintain a mathematics resource center.*

16. Each secondary school with four or more mathematics teachers should have a mathematics department chairman. (In smaller schools the department should be organized and run by all mathematics teachers acting as a committee of the whole.)

The chairman should be chosen by fellow teachers and admininstrators on his ability to serve rather then tenure. Among his responsibilities may be the following. He should:

- *a. implement and coordinate curriculum development*
- *b. be available for observation and consultation and provide opportunities for teachers to observe each other and to exchange ideas*
- *c. be directly involved in the selection of new mathematics teachers*

d. orient and aid the new, inexperienced teachers
e. schedule and chair frequent department meetings
f. cooperate with the teachers of the department in designating their own teaching assignments
g. coordinate the rotation of the teaching responsibilities among the staff so that all teachers gain experience in the teaching of all levels of courses and students in areas where they are qualified
h. fulfill his budgetary responsibilities
i. coordinate recommendations to the library and resource center for new materials
j. initiate joint meetings and activities with staff from other buildings and other grade levels.

In order to complete such responsibilities, the department chairman should have at least one less class per day than the normal teaching load. It should also be emphasized that this released time be flexible enough to enable him to carry out these activities. Mathematics departments should be provided with a reasonable and adequate budget and the department chairman should be given the responsibility for dispersing these funds.

CURRICULUM DEVELOPMENT

The pressures of change and innovation directed toward excellence in education demand that each school system continuously assess its effectiveness. We must concern ourselves not only with what mathematics we teach, but also how, to whom, and under what circumstances. Recommendations for curriculum changes should include provisions for the necessary retraining of teachers.

17. Each school district should organize for curriculum change by providing committee structures, office and clerical assistance, and curriculum leadership.

The organization should promote K-12 articulation as well as horizontal coordination. Both teachers and students should be encouraged to participate actively in curriculum development. Key committee members should be provided with released time from normal duties or given other compensation for their extra efforts.

18. Each school district should offer extended contracts to selected teachers to pursue curriculum assessment and development during the summer.

These teachers should be hired on extended contracts prorated at their regular professional salary. (It seems a desirable long-range goal to work toward retraining staff members on at least a 10½ month appointment. This increase in the term of employment should be aimed at encouraging professional maturation through a variety of activities such as formal schooling and curriculum development.)

IN-SERVICE RETRAINING

Altering the curriculum in any significant way will involve much more than subject matter changes. It will involve the way teachers think about the curriculum, the way they approach their teaching, and the way they relate to their students. In-service retraining programs should be directed at providing teachers with opportunities to explore many facets of mathematics education.

19. School districts should encourage their teachers to participate in both college-sponsored and district-sponsored in-service work.

Districts should endeavor to cooperate with the colleges to offer in-service work to meet the needs of the teachers in the district. Whenever possible, districts should work together to establish needed in-service programs. Larger districts should maintain a continuing planned program of in-service education for their teachers.

20. In-service work should provide credit

for salary increments.

All approved in-service courses, whether taught by college teachers, coordinators, or local teachers should provide credit for salary increments. Whenever possible such work should carry college credit.

21. The profession should seek alternative ways to provide valuable in-service education for teachers.

There are many ways other than formal study which are educationally valuable to teachers in their work. We suggest that curriculum development, personal interaction with other mathematics educators, participation in professional conferences, practical work experience, and independent research are but a few such alternatives.

RESPONSIBILITIES OF HIGHER EDUCATION

Our primary concern here is the education of mathematics teachers, though we recognize that higher education has obligations which transcend that goal. All those who teach mathematics must know the subject at a level significantly higher than that at which they teach. But that is not enough. Higher education must provide prospective teachers with the opportunity to acquire and develop a wide range of desirable qualities while imparting to them the will and the background to continue to grow and mature as mathematics educators after they become members of the teaching profession.

PRE-SERVICE EDUCATION

22. Mathematics education should be broadly defined to include a wide range of interdisciplinary experiences which would help the prospective teacher better understand the following:

a. mathematics
b. the application of mathematics
c. the aesthetics and the history of mathematics and the contribution of mathematics to our culture
d. how people learn mathematics and how to help them learn it
e. the role of mathematics in the total educational environment
f. the special mathematical needs of exceptional children and how to serve them

23. Mathematics educators should work with members at all levels and in all areas of the educational community to better identify both the humanistic and the academic qualities prerequisite to excellence in teaching.

A. While most colleges provide a conventionally adequate mathematics program for prospective teachers, consideration should be given to insuring that the course work is relevant to their needs.
B. All secondary mathematics teachers should have a major in mathematics. Such a major should be carefully designed to allow, whenever possible, a wide choice of alternative course work. We recommend, for example, that special courses for the teaching of students typically labeled as slow or reluctant learners be offered.
C. We recognize that mathematics proficiency, while it is necessary, is not sufficient for today's teacher. We urge colleges to provide more and better opportunities for teachers to develop the social and humanistic qualities necessary to cope with a complex and changing educational world.
D. Persons whose apathy, academic ineptitude, or lack of sensitivity clearly disqualify them as teaching candidates should be refused admittance to the profession.

24. Prospective mathematics teachers at all levels should be given the opportunity to gain wide exposure to and basic knowledge

of innovations and current thinking in mathematics education.

A. *It is becoming increasingly apparent that children learn mathematics differently from adults. Elementary teachers should have firsthand experience with the theories and techniques of Piaget and others who have researched the ways children learn mathematics.*
B. *Prospective teachers should be familiar with prominent mathematics curriculum projects in this and in other countries. Innovations such as the mathematics laboratory and the mathematics resource center should be well known to them.*
C. *Colleges should establish a Mathematics Education Resource Center to collect books, journals, audio-visual materials, math lab equipment and such other supplies as are needed to provide students actual experience in learning, developing and practicing instructional techniques and to provide actual experience in establishing good learning environments.*
D. *Prospective mathematics teachers at all levels should be encouraged to join at least the Montana Council of Teachers of Mathematics and the National Council of Teachers of Mathematics.*

25. Pre-service teaching experience is an important and critical part of teacher preparation. We urge colleges to search for new and improved ways to provide their students with actual teaching experience.

A. *Prospective teachers at all levels should have earlier and more frequent exposure to actual teaching situations.*
B. *Student teachers should be encouraged to develop their own style and to innovate. They should not be so restricted that they feel bound to merely imitate the style and techniques of their supervising teacher.*
C. *Where possible, student teachers should work with several established teachers and should be exposed to a variety of teaching models and learning situations. Student teachers should have free time to acquaint themselves with the entire school environment.*
D. *The profession, through organizations such as MCTM in conjunction with the colleges, should establish guidelines for selecting teachers best qualified to work with student teachers.*
E. *College personnel who supervise prospective mathematics teachers should be well qualified mathematics educators.*
F. *Members of the profession should accept the responsibility of supervising student teachers and the responsibility of providing a* **fair** *and* **accurate** *appraisal of their work.*

26. We believe that teachers must have assistance in the department and the classroom if they are going to engage in professional activities.

All junior colleges and universities should be encouraged to provide training programs for para-professionals and teacher aides. Students unable to qualify for teacher certification who want to participate in education should be able to fulfill carefully planned training toward para-teacher certification. Such students should have the ability and personality to work with both teachers and students. They should have courses in high school and college mathematics, introduction to education, psychology and personality development, and clerical or secretarial techniques. More talented students who are studying for teacher certification should be encouraged to participate in part-time pre-professional employment as teacher assistants. Such experience, not to be seen as an internship, should be looked upon as a valuable student teaching experience.

IN-SERVICE AND POST GRADUATE EDUCATION

27. Higher education can help provide opportunities for the teacher's continued aca-

demic growth through offering relevant in-service work.

A. *Colleges and schools must cooperate to offer academic opportunities which meet teachers' needs. Teachers should have a voice in the content and structure of all in-service programs designed to serve them.*
B. *Graduate programs in mathematics and mathematics education should be carefully examined on a statewide basis to determine if present emphases and priorities serve the best interests of our state and its needs.*
C. *Sound and relevant programs leading to the Master's and the Doctorate should be available in Mathematics Education. All such programs should be extremely flexible to meet individual needs.*

RESEARCH, DEVELOPMENT AND LEADERSHIP

28. We look to higher education for assistance to promote needed change and to provide needed counsel in our schools. We can no longer be satisfied with merely the content of the mathematics to be taught. We must concern ourselves as well with attitudes and with how, to whom, and under what circumstances we teach. We believe the following recommendations will better equip colleges to meet this need.

A. *We urge increased cooperation between Schools of Education and Mathematics Departments. We recommend that joint appointments be made and that larger schools consider the development of Mathematics Education Departments.*
B. *We encourage professional mathematicians to devote a portion of their energies to the needs of mathematics education and advise that this include direct classroom experience with elementary and secondary students. We urge professional mathematicians to work with us to develop a positive image for mathematics educators at all levels.*
C. *We urge those who teach teachers to present a model worth emulating. Active research in mathematics education and participation in the development of mathematics curricula must be considered respectable academic pursuits.*
D. *Higher education should seek advice and counsel "from the field" and should make provisions for the implementation of suggestions when such is in order.*

RIGHTS AND RESPONSIBILITIES

We, the Montana teachers of mathematics, recognize our obligation to preserve the rights and freedoms of all members of the educational community. We accept this obligation because we believe that education in a democracy depends for its success upon the guarantee of fundamental liberties. We further recognize that those who would share these liberties must accept certain responsibilities.

The following recommendations reflect some of our concerns for the rights and responsibilities of teachers. We have also set forth some guidelines for student involvement which we believe will help them become more informed and effective citizens.

THE TEACHER

29. Mathematics teachers must keep professionally alive.

Each teacher should belong to and actively support his professional organizations. He should, at least, be a member of MCTM and NCTM.

30. Each mathematics teacher should attempt to maintain a current knowledge of contemporary thinking and innovations in education, and, in particular, mathematics education.

It is irresponsible for a teacher to maintain existing instructional structures and techniques or to devise new ones without the benefit of experiences broader than his own. Each teacher must take advantage of the advice and counsel of others in the field through reading professional journals and books, through attending professional meetings, and through exchanging ideas with teachers in his own and in other schools.

31. Each mathematics teacher is responsible for furthering his own formal education.

A teacher should return periodically to the formal classroom for courses in mathematics, mathematics education and related areas. They should do so not simply to advance on the salary scale, but to better comprehend the complexities of the entire educational process and, in particular, to advance their understanding of mathematics and how people learn it.

32. Mathematics teachers must seek and accept an active role in determining school policies and in developing the curriculum.

Since the teacher plays such a central role in the educational process it is his responsibility to participate in the development of a sound learning environment. He must refuse to do those things, however administratively convenient, which are personally demeaning or which are harmful to his students.

33. Decisions regarding accountability structures and procedures must be made by teachers working with other members of the educational community.

Whatever other obligations we might have, the teacher's first responsibility is to the student he teaches. Narrowly conceived accountability schemes which rely solely on objective test data or comparisons with "normed" standards must be rejected as being unfair to teachers and ultimately harmful to students. Since we believe we should be helping students grow according to their particular needs and abilities rather than shaping them to a preconceived mold, we reject accountability structures

which measure student growth merely on their ability to meet performance criteria on behaviorally stated objectives. Finally, we recognize that we cannot be held accountable for outcomes over which we have insufficient control.

34. We believe that mathematics teachers everywhere have a responsibility to help gain public awareness, understanding, and support for mathematics programs.

Educators in other disciplines should be assisted in recognizing and understanding the importance of mathematics in our society, including its aesthetic and cultural contributions, and its role in the formal education of all citizens. Mathematics teachers should be willing to speak to interested groups of parents and teachers; they should offer effective adult education courses which have as a central objective the establishment of positive attitudes toward mathematics and its importance in our culture.

35. Educators' personal rights and freedoms outside the academic setting must be maintained.

THE STUDENT

36. We urge schools to move toward the implementation of programs to provide early childhood mathematical experiences for all pre-school children.

There is increasing evidence that many of the most significant and durable mathematical concepts are best formed in the early childhood years and that failure to provide imaginative mathematical experiences at an early age may forever stunt the mathematical aptitude of the student. Many children are provided, consciously or unconsciously, with such opportunities in the home; many others, however, are not.

37. Children have a right to unstructured mathematical activity and to the opportunity to explore mathematics as an active participant rather than a passive listener.

We believe that children need to be given time for independent investigation of mathematics at their own level and occasionally of their own choosing. We urge teachers to take mathematical advantage of the child's natural inclination to play. Insofar as it is possible, we support attempts to provide students with the opportunity to learn mathematics at their own rate, and in settings which provide concrete mathematical experiences.

38. School districts should provide meaningful recognition of their students for academic excellence in mathematics at their own level.

Opportunities for community display of mathematics projects may be provided in a mathematics fair or club. Inter-district cooperation is urged in planning and presenting a multi-district quiz bowl or math club. Students should have the opportunity to participate in Mu Alpha Theta, to use the NCTM's **Mathematics Student Journal,** *and to participate in science fairs if they wish. Special sectional meetings at MCTM conferences should be planned for students who are interested in mathematics and in teaching.*

39. Students who display the humanistic and academic qualities which indicate that they might make a contribution to education as teachers should be encouraged to enter the profession.

Every mathematics teacher should cooperate by consciously attempting to offer encouragement and support to those students whose talents and characteristics would assist them in becoming effective teachers. Each teacher should strive to offer himself as a model whose personal and scholastic qualities he would want his students who become teachers to emulate.

40. Every student should have the opportunity to pursue mathematical growth in ways suited to his needs, his background, and his ability.

We urge schools to look for ways to broaden and enrich the mathematics

curriculum. We are particularly aware of the need not only to provide all students with the basic mathematical skills but to expose them to the power and limitations of mathematical problem solving and to share with them the opportunities for creativity and enjoyment which the study of mathematics can afford. We believe students should be offered alternative mathematical subject matter to be pursued and alternative ways to pursue it. These alternatives should not take the form of irresponsible random activities but rather should be based on sound mathematical and pedagogical foundations.

41. Each student should have the opportunity to have his mathematical growth evaluated in ways suited to his needs, his background, and his ability.

Just as students vary in the ways they best learn mathematics, they vary in the ways this learning is exhibited. Whenever possible, teachers should entertain a wide variety of responses in both cognitive and affective areas as evidence of mathematical growth whether or not this growth corresponds to a preconceived goal. Attempts to establish, in advance, exactly what responses under exactly what conditions will be allowed as evidence of satisfactory growth tend to limit rather than broaden the range of acceptable student response and may, thereby, limit future mathematical attainment.

42. Secondary students should be allowed and encouraged to participate in the design of the mathematics curriculum and in the establishment of school policies which directly affect them.

A. We recognize the need for a greater degree of advice, counsel and supervision by the faculty in secondary schools than might be necessary, for example, in the colleges. But if we believe we should train students in the democratic process, should allow them freedom of expression and ideas and that we should simultaneously build in them a sense of responsibility and good citizenship, we must make it possible for them to more effectively participate in the educational process.

B. Rules and regulations by which the schools are run should be established and assented to by all members of the educational community who are served by them including students. They should be in writing and easily accessible. Such rules and regulations should not violate personal liberties guaranteed by local, state, and federal laws and, in particular, the Constitution.

THE ROLE OF MCTM

We believe that the MCTM can supply leadership to effectively utilize the abilities and resources of Montana mathematics teachers to provide better educational opportunities for youth. The recommendations which follow reflect some of the professional concerns to which MCTM might address itself.

43. The MCTM should encourage mathematics teachers in each school to establish educational priorities guided by this document.

Such priorities should be set in light of the special needs and resources of the individual schools. MCTM should assist schools in setting timetables and establishing strategies for their implementation.

44. The MCTM should work toward establishing more detailed guidelines for the following:

a. pre- and in-service training of teachers
b. qualifications for college personnel who train teachers
c. qualifications for math consultants, department heads and elementary math specialists
d. design of mathematics facilities
e. qualifications and responsibilities for teachers who work with student teachers
f. qualifications and training of paraprofessionals and teacher aides
g. accountability structures.

45. The MCTM should continue to sponsor mathematics conferences.

A. General meetings and mini-conferences should be held so that most mathematics teachers have the opportunity to attend one without traveling a prohibitive distance.
B. Conferences should be sponsored which are devoted to special concerns such as slow and reluctant learners, the development of math resource centers, the use of math lab techniques, the role of computers and the role of geometry.
C. Conferences should be sponsored for special groups such as secondary and college department heads, junior college teachers, general mathematics teachers and teacher education personnel.

46. The MCTM should sponsor a continuing program of recruitment into the profession.

Interested high school and college students, in particular, should be invited to participate in our conferences. Special sessions should be planned for them.

47. The MCTM should work toward increased involvement in the organization by all mathematics teachers by providing increased opportunity for participation.

A. Members should be encouraged to actively participate in conferences, to serve on committees, and to

otherwise participate in organizational activity.

B. Nonmembers should be encouraged to join by educating them to the advantages of membership and by convincing them of our commitment to improve mathematics education. Since elementary teachers have many organizations to which they might belong, the Council should consider the support of joint conferences with other professional groups.

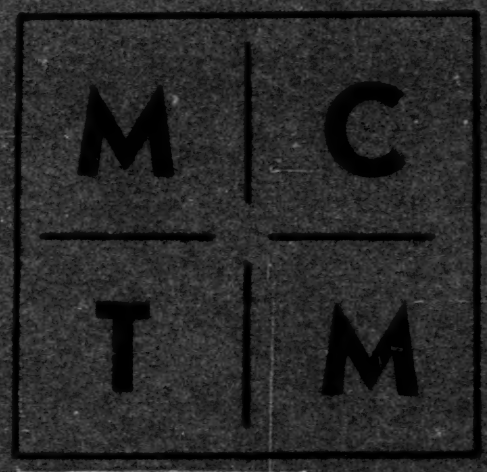
48. The MCTM should act as a spokesman for the mathematics teaching profession in Montana.

49. The MCTM should assist school districts in implementing a program of in-service education.

The Council may provide leadership in initiating courses, in teaching courses, and in recognition of these courses. The important service of publicizing available in-service courses should be developed.

50. The MTCM should continue to sponsor curriculum development within and between districts.

The Council could be especially helpful in matching talented leaders with smaller school districts which may not have the leadership of curriculum specialists. The MCTM should generate a listing of interested leaders who could provide temporary consultation to schools seeking help.



MONTANA COUNCIL OF TEACHERS OF MATHEMATICS

The Professional Organization of Mathematics Teachers in Montana